ERRATA SHEET NO. 1 - ITEM 7 NOVEMBER 10, 2004

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

TENTATIVE ORDER NO. R9-2004-0154 NPDES PERMIT NO. CA0001368

WASTE DISCHARGE REQUIREMENTS
FOR
DUKE ENERGY SOUTH BAY, LLC
SOUTH BAY POWER PLANT
SAN DIEGO COUNTY

The following changes to tentative Order No. R9-2003-0140 and Fact Sheet reflect revisions to address comments submitted to the Regional Board by interested persons. The changes also reflect corrections and edits made by Regional Board staff based on further review and analysis of the tentative documents. The deleted text is shown as *strikethrough*; added text is shown as *underlined*.

1. TENTATIVE ORDER NO. R9-2004-0154

- a. page 1, Finding 5 of tentative Order
 - 5. The SBPP utilizes San Diego Bay water to cool the steam condensers associated with each of its four Units. The water is drawn into the power plant via three intake structures located in San Diego Bay. The heated once-through cooling water is discharged via four outflow pipes to a tidal discharge basin on the plant property. Cooling water from the discharge basin is returned to San Diego Bay via a discharge channel. The temperature of the discharge may be as much as 25 to 30 23 to 25 degrees F higher than the ambient intake water when the plant is operating at peak load. This correlates to results in discharge temperatures as high as 100 degrees F for several hours of the day.
- b. page 2, Finding 8 of tentative Order
 - 8. The SBPP cooling water discharge may cause or has the reasonable potential to cause or contribute to an excursion above the narrative objective of toxicity stated in the Basin Plan. This is due to the combined effects of total residual chlorine, chlorinated organic compounds, copper, and other trace metals contained in the discharge. The combined effects of total residual chlorine, chlorinated organic compounds, copper and other trace metals contained in the SBPP cooling water discharge may cause or contribute to a violation of the narrative toxicity objective stated in the Basin Plan. The average survival rate of test species exposed to the SBPP discharge ranges from 90 to 100 percent.

c. page 4, Finding 14 of tentative Order

14. The biotic communities in the immediate vicinity of the discharge point and in the discharge channel have been degraded by exposure to the once-through-cooling water discharge from the SBPP in spite of effluent limits intended to mitigate the thermal impact of the discharge. The degradation to the biotic communities is due to several factors, including elevated temperature, flow volume, and flow velocity. The existing conditions within the discharge channel, particularly within 1000-1500 feet of the discharge basin, do not constitute a "balanced indigenous community."

The degradation to biotic communities includes a lower diversity of benthic invertebrates residing in the near field stations of the discharge channel compared to those in reference stations outside the discharge channel. Furthermore, certain invertebrate species (including polychaete worms and amphipods) are largely absent in near field stations of the discharge channel. These species were found in abundant quantities in reference stations outside the discharge channel. The absence of these species from the discharge channel demonstrates that these species cannot survive under the warm thermal regimes of the discharge channel and were being adversely impacted.

In addition to a degradation of benthic invertebrates, up to 104 acres of critical eelgrass habitat has been precluded from the discharge channel and other areas of south San Diego Bay due to the redistribution of turbidity in the Bay from the SBPP discharge.

d. page 4, Finding 16 of tentative Order

16. Pursuant to 40 CFR 122.45 of the NPDES regulations, effluent limitations must be met at point of discharge, prior to the effluent entering the receiving waters of the United States. Pursuant to 40 CFR 122.41(j)(1) of the NPDES regulations the samples and measurements taken for the purpose of monitoring shall also be representative of the monitoring activity.

SBPP's existing location for measurement of discharge temperature for compliance with its thermal discharge limitations (average daily and instantaneous maximum Delta T limitations) does not comply to the NPDES regulations. This is because the existing discharge temperature measurement location (Station S1) is not representative of the SBPP discharge and is over 1,000 feet downstream of discharge and part of the receiving waters of south San Diego Bay. The appropriate location for measurement of discharge temperature to comply with thermal discharge limitations is within the SBPP discharge basin at or inland of the property line (Station S2).

In order to determine whether or not the discharge from SBPP is in compliance with applicable effluent limitations for waste heat (average daily and instantaneous maximum Delta T) at the point of discharge, samples of the discharge must be taken at the point of discharge before the cooling water from SBPP enters, and is diluted by,

waters of San Diego Bay [40 CFR 122.41(j)(1) and 122.45]. Samples taken at the existing monitoring location at Station S1 (approximately 1,000 feet along the discharge channel from the point of discharge at SBPP) are not representative of the cooling water discharge at the point of discharge.

Monitoring Station S2 (currently located in the discharge basin at or near the fence delineating the property line of the SBPP leasehold) may provide a more appropriate location for measurement of discharge temperature at the point of discharge.

- e. page 5, Finding 19 of tentative Order
 - 19. The thermal discharge limitations (average daily and instantaneous maximum Delta T limitations) applicable to the SBPP discharge do not ensure water quality necessary for the protection and propagation of balanced indigenous communities within the SBPP discharge channel, particularly within 1000-1500 feet of the discharge basin, as required by Section 316(a) of the Clean Water Act (CWA). Pursuant to CWA Section 316(a) the existing thermal discharge limitations (average daily Delta T = 15 degrees F and instantaneous maximum Delta T = 25 degrees F) applicable to the SBPP discharge are not more stringent then necessary for protection and propagation of a "balanced indigenous community" within the discharge channel. Furthermore, these These thermal limitations, however, do not fully ensure water quality needed for attainment of the beneficial uses of south San Diego Bay as required by the *Basin Plan* and *State Thermal Plan*.

The SBPP discharge channel exhibits a lower overall diversity of benthic invertebrates and the absence of certain indigenous invertebrate species (polychaete worms and amphipods). Furthermore, up to 104 acres of eelgrass habitat (critical to the protection and propagation of indigenous communities) have been precluded from the discharge channel and other areas of south San Diego Bay due to the redistribution of turbidity in the Bay from the SBPP discharge.

Measures to abate the detrimental impacts of the SBPP discharge to the discharge channel are needed. Measures to restore the Beneficial Uses of south San Diego Bay and to rehabilitate the damage caused to the biological resources of the Bay from the over 40 year operation of the power plant are also necessary.

- f. page 5, Finding 20 of tentative Order
 - 20. The location, design, construction and capacity of the existing cooling water intake structures at SBPP fail to reflect the Best Technology Available (BTA) for minimizing adverse environmental impact as required by Section 316(b) of the CWA. The location, design, construction and capacity of the existing cooling water intake structures at SBPP fail to reflect the Best Technology Available (BTA) for minimizing adverse environmental impact as required by new regulations promulgated by U.S. EPA to implement Section 316(b) of the Clean Water Act at large existing electric generating

plants (Phase II rule).

As indicated in the technical study report titled "SBPP Cooling Water System Effects on San Diego Bay, Volume II: Compliance with Section 316(b) of the Clean Water Act for the South Bay Power Plant, August 2004" submitted by Duke Energy, approximately 27 percent of the goby complex and 50 percent of the longjaw mudsucker larval source water populations are lost annually due to entrainment in the SBBP. Furthermore, approximately 13 percent of equivalent adult anchovy and 15 percent equivalent adult silverside fish populations are also lost annually due to larval entrainment losses. These losses of larval and adult fish populations due to entrainment in the SBPP constitute a significant adverse environmental impact.

- g. page 6, Finding 23 of tentative Order
 - 23. Since copper in the SBPP discharge has the reasonable potential to cause or contribute to an excursion above the CTR criteria, water-quality based effluent limitations (4.44 μg/l maximum daily and 3.53 μg/l average monthly) are required for copper. Duke Energy is unable to immediately comply with the copper discharge limitations under the current design and operation of the SBPP. It is appropriate to provide additional time (up to 36 months) for Duke Energy to modify its operations or implement control take other measures in order to comply with the copper discharge effluent limitations.
- h. page 16, Section E.2 (Special Supplemental Studies and Compliance Workplans) of tentative Order
 - 2. Workplan for Relocation of Thermal Discharge Limitations Compliance Point to the Property Line

Order No. R9-2004-0154 requires the discharger to comply with its thermal discharge limitations (see Section B.1(a) of this Order) at Station S2 (SBPP property line) no later than 36 months after adoption of the Order. In the interim, compliance with thermal discharge limitations shall be enforced at Station S1 (i.e. 1000 feet into the SBPP discharge channel).

This change in compliance point is necessary in order for Duke Energy to fully comply with federal NPDES regulations (40 CFR 122.45 and CFR 122.41(j)(1)) that require effluent limitations to be enforced a location that is at the point of discharge and representative of the discharge.

The discharger shall submit a Workplan that details the steps the discharger will be implementing to enable compliance with its average daily and instantaneous maximum Delta T thermal limitations at Station S2. These steps may include, but not limited to, implementing a reduction in power generation output, improving thermal efficiency of its steam turbines, routing waste heat from its turbines to other industrial applications. The Workplan shall also discuss the financial and operational impacts of the relocation of the temperature compliance point on SBPP and on the viability of its power grid. Furthermore, the report shall also identify the impact of

this

change on the reliability-must-run (RMR) status of the SBPP, as designated by the California Independent System Operator (ISO).

The discharger shall submit the Workplan no later than 12 months after adoption of the Order. Progress Reports on the implementation of the Workplan shall be submitted on a semiannual basis after submission of the Workplan. A Final Technical Report shall be due no later than 30 months after adoption of the Order.

Within 36 months after adoption of the Order the discharger shall develop and implement measures necessary to achieve compliance with its average daily and instantaneous maximum Delta T thermal limitations at point of discharge (i.e. at or inland of the SBPP property line). These measures may include, but are not limited to, implementing a reduction in power generation output, improving thermal efficiency of its steam turbines, and routing waste heat from its turbines to other industrial applications. In the interim, compliance with Delta T limitations shall be enforced at Station S1 (i.e. 1,000 feet into the SBPP discharge channel).

Within 12 months after adoption of the Order the discharger shall submit to the Regional Board a Workplan for the development and implementation of the measures necessary to achieve compliance with Delta T thermal limitations at the point of discharge and compliance with NPDES regulations 40 CFR 122.45 and 122.41(j)(1). The Workplan shall also discuss the financial and operational impacts of the relocation of the temperature compliance point on SBPP and on the viability of its power grid. Furthermore, the Workplan shall also identify the impact of this change on the reliability-must-run (RMR) status of the SBPP, as designated by the California Independent System Operator (ISO).

The discharger shall submit to the Regional Board semiannual Progress Reports on the implementation of the Workplan after submission of the Workplan. A Final Progress Report shall be due no later than 30 months after adoption of the Order.

- i. page 16, Section E.3 (Special Supplemental Studies and Compliance Workplans) of tentative Order
 - 3. Workplan for Compliance with Final Copper Effluent Limitations

The discharger shall develop and implement a Workplan to comply with its final effluent limitations for total recoverable copper (see Section B.1(e) of this Order). The Workplan shall describe the additional source control measures, pollutant minimization actions, or waste treatment, or other measures the discharger proposes to implement in order to comply with its final copper limitations. The Workplan may also include proposals to conduct Water Effect Ratio or translator studies that could be used to develop site-specific objectives for total recoverable copper in south San Diego Bay. The Workplan shall estimate the concentration and mass of copper that will be reduced in the discharge due to the proposed measures. The discharger shall fully implement the

Workplan and comply with its final effluent limitations for total recoverable copper no later than <u>36 months</u> after adoption of the Order.

The discharger shall submit the Workplan no later than <u>12 months</u> after adoption of the Order. Progress Reports on the implementation of the Workplan shall be submitted on a <u>semiannual basis</u> after submission of the Workplan. A Final <u>Technical Progress</u> Report on the implementation of the Workplan will be due no later than <u>30 months</u> after adoption of the Order.

FACT SHEET

- a. page 1 (Summary of Significant Changes and New Requirements Incorporated Into Renewal NPDES Permit (Order No. R9-2004-0154), 1.a, New Effluent Limitations for Copper) of Fact Sheet
 - a. New Effluent Limitations for Copper

Final effluent limitations for total recoverable copper (4.44 µg/l – maximum daily and 3.53 µg/l – average monthly) have been incorporated into the tentative Order. These limitations were calculated based on the *Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy, SIP) and the *California Toxics Rule* (CTR), in conjunction with recent CTR test data provided by Duke Energy.

The tentative Order includes a time-schedule for Duke Energy to comply with these final CTR limitations for copper. Duke Energy will be required to develop and implement a Workplan for additional source control measures, pollutant minimization actions, or waste treatment to control copper in its discharge, or other measures to comply with the final CTR limitations for copper. Duke Energy will be provided 12 months to develop the Workplan. Duke Energy will be required to fully implement the Workplan and comply with its final CTR limitations for copper no later than 36 months after adoption of the Order. Progress reports on the implementation of the Workplan will be required on a semiannual basis. A Final Technical Progress Report on the implementation of the Workplan will be due no later than 30 months after adoption of the Order.

- b. page 2 (Summary of Significant Changes and New Requirements Incorporated Into Renewal NPDES Permit (Order No. R9-2004-0154), 1.b, New Requirement for Relocation of Thermal Discharge Limitations Compliance Point) of Fact Sheet
 - b. New Requirement for Relocation of Thermal Discharge Limitations Compliance Point:

The tentative Order includes requirements for Duke Energy to develop, submit, and implement a Workplan to achieve compliance with its thermal discharge limitations (i.e. average daily and instantaneous maximum Delta T limitations of 15 and 25 degrees F respectively) at the SBPP property line (monitoring Station S2).

Compliance of thermal discharge limitations at Station S2 (property line) shall be enforceable no later than 36 months after adoption of the Order. In the interim, compliance with effluent temperature limitations shall be enforced at monitoring station S1 (i.e. 1000 feet into the discharge channel).

The tentative Order includes requirements for Duke Energy to develop, submit, and implement a Workplan to achieve compliance with its thermal discharge limitations (i.e. average daily and instantaneous maximum Delta T limitations of 15 and 25 degrees F respectively) at the point of discharge (i.e. at or inland of the SBPP property line) within 36 months. In the interim, compliance with effluent temperature limitations shall be enforced at monitoring station S1 (i.e. 1000 feet into the discharge channel).

This change in compliance point is necessary it order for Duke Energy to fully comply with federal NPDES regulations (40 CFR 122.45 and CFR 122.41(j)(1)) that require effluent limitations to be enforced a location that is close to <u>or at</u> the point of discharge and representative of the discharge.

Duke Energy shall be required to submit the Workplan no later than 12 months after adoption of the Order. Progress Reports on the implementation of the Workplan shall be submitted on a semiannual basis after submission of the Workplan. A Final Technical Report on the implementation of the Workplan will be due no later than 30 months after adoption of the Order. Compliance of thermal discharge limitations at Station S2 (property line) shall be enforceable no later than 36 months after adoption of the Order. A Final Progress Report on the implementation of the Workplan will be due no later than 30 months after adoption of the Order.

- c. page 3 (Summary of Significant Changes and New Requirements Incorporated Into Renewal NPDES Permit (Order No. R9-2004-0154), 3.a, Findings of Adverse Environmental Impact) of Fact Sheet
 - a. Findings of Adverse Environmental Impact

Findings have been included in the tentative Order (based on the Updated Section 316(a) Study) that acknowledge that the SBPP's discharge of once-through cooling water to south San Diego Bay has adversely impacted the Beneficial Uses (including Estuarine Habitat; Marine Habitat; Wildlife Habitat; Rare, Threatened or Endangered Species; Preservation of Biological Habitats of Special Significance; and Shellfish Harvesting) within the SBPP discharge channel, particularly in the area within 1000-1500 feet of the property line. and that the existing conditions in the discharge channel do not constitute a "balanced indigenous community."

The Regional Board finds has determined that Duke Energy should be required to take measures to abate mitigate the detrimental impacts of the SBPP discharge to the discharge channel. Duke Energy should have to propose measures to restore the Beneficial Uses of

south San Diego Bay and to rehabilitate the damage caused to the biological resources of the Bay from the over 40 year operation of the power plant. The Regional Board intends to issue a CWC Section 13267 to Duke Energy directing it to provide a Workplan that proposes specific abatement and restoration measures. Duke Energy will be responsible for the financial costs associated with the implementation of the mitigation and restoration measures. In an action separate from the adoption of the tentative Order, the Regional Board will consider the issuance of a CWC Section 13267 letter to Duke Energy directing it to provide a Workplan that proposes specific abatement and restoration measures. Duke Energy will be responsible for the financial costs associated with the implementation of the abatement and restoration measures.

Duke Energy will be required to develop and implement the abatement mitigation and restoration Workplan in consultation with representatives of the USEPA, Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), RWQCB/SWRCB, and the California Coastal Commission.

The Regional Board recognizes that the requirement to relocate the discharge temperature compliance point from Station S1 to the SBPP property line in order to comply with NPDES regulations (40 CFR 122.45 and CFR 122.41(j)(1)), may provide for important side benefits. In particular, this relocation may help in abating some of the detrimental thermal impacts to the discharge channel. This change in monitoring location will eliminate any potential mixing or dilution zones for temperature and ensure that less heat is dispensed to the discharge channel mixing echannel. Since there is a direct correlation between DO levels in the discharge channel and temperature, less heat dispensed to the discharge channel may also provide for higher DO levels. Higher DO levels and lower temperature regimes may positively impact the health and survivability of fish, benthic invertebrates, and eelgrass in the discharge channel. The Workplan developed by Duke Energy would, however, have to propose additional measures to reduce the thermal impacts of the discharge on the marine resources of the discharge channel and to fully restore Beneficial Uses. The Workplan would also have to propose measures to abate the impacts of the high velocity and volume of the discharge (redistribution of turbidity) on the discharge channel.

d. page 9, paragraph 2, Section C.1 (Description of Cooling Water System and Associated Discharges) of Fact Sheet

1. DESCRIPTION OF COOLING WATER SYSTEM AND ASSOCIATED DISCHARGES

The primary waste discharges from the SBPP are associated with the once-through (non-contact) cooling water system. The cooling water system is associated with the four steam units, and utilizes San Diego Bay as both source water and receiving water. Each unit utilizes a closed cycle in which high quality feed water is turned to steam in boilers, the steam is passed through turbines to generate electricity, the steam is condensed to water by the cooling water system, and the feed water is returned to the boilers. The elevated temperature once-through cooling water is discharged back to the bay via a discharge channel. The temperature of the

discharge may be as much as 25 to 30 23 to 25 degrees F higher than the ambient intake water when the plant is operating at peak load. The power plant transfer approximately 3.40 x 109 Btu/hr of heat to 601.13 MGD of cooling water when the plant is operating at peak load. The power plant may be subject to peak load conditions for as much as eight to ten hours during hot summer days. This may correlate to discharge temperatures as much as 100 degrees F for several hours of the day.

e. page 17, Section E.1 (Summary of Waste Discharge Impacts) of Fact Sheet

E. SUMMARY OF WASTE DISCHARGE IMPACTS

The discharge of once-through cooling water to south San Diego Bay has adversely impacted the Beneficial Uses within the SBPP discharge channel, particularly in the area within 1000-1500 feet of the property line. The 2003 updated 316(a) study report, SBPP Cooling Water System Effects on San Diego Bay, Volume 1: Compliance with Section 316(a) of the Clean Water Act for the South Bay Power Plant confirmed that certain areas of the SBPP discharge channel have detrimental impacts that are attributable to the elevated temperatures and high volumetric flow rates associated with the SBPP discharge (see Section F.2.a of this Fact Sheet for a description of the report and its findings). The report indicates that up to 104 acres of critical eelgrass habitat have been lost because of the redistribution of turbidity in the Bay due to the SBPP discharge. Furthermore, the report indicates that the overall diversity of benthic invertebrates residing in the near field stations of the discharge channel is much lower than at reference stations outside the discharge channel. The studies also indicates that certain invertebrate species (including polychaete worms and amphipods) are largely absent in near field stations of the discharge channel. These species were found in abundant quantities in reference stations outside the discharge channel. The absence of these species from the discharge channel demonstrates that these species could not survive under warm thermal regimes and were being adversely impacted. The existing conditions within the discharge channel, particularly within 1000-1500 feet of the discharge basin, do not constitute a "balanced indigenous community."

The Beneficial Uses (as defined by the Basin Plan) that are potentially impaired due to the SBPP discharge include: Estuarine Habitat; Marine Habitat; Wildlife Habitat; Rare, Threatened or Endangered Species; Preservation of Biological Habitats of Special Significance; and Shellfish Harvesting. It is evident that the impacts on Beneficial Uses due to the discharge of once-through-cooling water cannot be eliminated except through termination of the discharge. The adverse impacts are due to the individual and combined effects of the elevated temperature of the discharge and the high volume and velocity of the discharge (redistribution of turbidity).

Duke Energy will be required to take measures to abate the detrimental impacts of the SBPP discharge to the discharge channel. Duke Energy will also have to propose measures to restore the Beneficial Uses of south San Diego Bay and to rehabilitate the damage caused to the biological resources of the Bay from the over 40 year operation of the power plant. The Regional Board intends to issue a CWC Section 13267 to Duke Energy directing it to provide a Workplan that proposes specific abatement and restoration measures. Duke Energy will be responsible for the financial costs associated with the implementation of the mitigation and

restoration measures. In an action separate from the adoption of the tentative Order, the Regional Board will consider the issuance of a CWC Section 13267 letter to Duke Energy directing it to provide a Workplan that proposes specific abatement and restoration measures. Duke Energy will be responsible for the financial costs associated with the implementation of the abatement and restoration measures. Duke Energy will be required to develop and implement the abatement mitigation and restoration Workplan in consultation with representatives of the USEPA, Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), RWQCB/SWRCB, and the California Coastal Commission.

The Regional Board recognizes that the requirement to relocate the discharge temperature compliance point from Station S1 to the SBPP property line in order to comply with NPDES regulations (40 CFR 122.45 and CFR 122.41(j)(1)), may provide for important side benefits. In particular, this relocation may help in abating some of the detrimental thermal impacts to the discharge channel. This change in monitoring location will eliminate any potential mixing or dilution zones for temperature and ensure that less heat is dispensed to the discharge channel. Since there is a direct correlation between DO levels in the discharge channel and temperature, less heat dispensed to the discharge channel may also provide for higher DO levels. Higher DO levels and lower temperature regimes may positively impact the health and survivability of fish, benthic invertebrates, and eelgrass in the discharge channel. The Workplan developed by Duke Energy would, however, have to propose additional measures to reduce the thermal impacts of the discharge on the marine resources of the discharge channel and to fully restore Beneficial Uses. The Workplan would also have to propose measures to abate the impacts of the high velocity and volume of the discharge (redistribution of turbidity) on the discharge channel.

f. page 37, Section F.3 (Thermal Plan, Workplan for Relocation of Thermal Discharge Limitations Compliance Point) of Fact Sheet

Workplan for Relocation of Thermal Discharge Limitations Compliance Point to the <u>Point of Discharge</u> (Property Line) (Station S2):

Duke Energy shall submit a Workplan that details the steps measures it will be implementing to enable compliance with its average daily and instantaneous maximum Delta T thermal limitations at the point of discharge (i.e. at or inland of the SBPP property line) Station S2 and compliance with NPDES regulations 40 CFR 122.45 and CFR 122.41(j)(1). These measures steps may include, but not limited to, implementing a reduction in power generation output, improving thermal efficiency of its steam turbines, and/or routing waste heat from its turbines to other industrial applications. The Workplan shall also discuss the financial and operational impacts of the relocation of the temperature compliance point on SBPP and on the viability of its power transmission grid. Furthermore, the Workplan shall also identify the impact of this change on the reliability-must-run (RMR) status of the SBPP, as designated by the California Independent System Operator (ISO).

Duke Energy shall be required to submit the Workplan no later than 12 months after adoption of the Order. Progress Reports on the implementation of the Workplan shall be submitted on a semiannual basis after submission of the Workplan. A Final Technical Progress Report on the implementation of the Workplan will be due no later than 30 months after adoption of the Order.

Compliance of thermal discharge limitations at the property line shall be enforceable no later than 36 months after adoption of the Order.